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ABSTRACT

Resource inventories are an important part of the data base to be handled in the planning process, both for theoretical analysis and design and for effective implementation. The classes of resources which must be investigated as an essential basis for modern planning include: (1) natural resources, (2) human resources, (3) physical capital and (4) other such as "know-how." With computers, this data base can be organized to serve for long (over 10 years), medium (3-10 years) and short (1-3 years) term planning. At the same time it can serve regional, sectorial and global planning. This organization of the data base is not only the most economical way of getting a return on the investment in data collection, but also the only way to ascertain that the end results of the many processes to which it must be subject are compatible with each other.
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Resource Inventories and Government Planning

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General Comments

Most developping countries regardless of their dominant politic or economic philosophies have deposited since 2 or 3 decades ago a lot of hope in Planning as a way to achieve the deepest felt aspirations of their soaring populations in the least time and with the least human effort. Planning means devising a way of making optimal use of resources to achieve specific goals in a specified time. In the modern world the scope of what is meant by resources goes far beyond earlier ideas. The predominant and obvious consideration of natural resources has been sinking in importance in contemporary thought, perhaps even more than it should.

After a quarter of a century of planning experience, most spirits are sobered and less elated. The many difficulties of actual Planning, at the stage of Design as well as during the much overlooked phase of Implementation, have proved too complex to be overcome, and there is a general feeling that a deep and searching reappraisal of the problem should take place. As a matter of fact, the undeniable achievements of the previous decades are connected with the identification of the many things that must be known before attempting the formulation of a plan, and the many things that must be organized and structured before hoping to implement it.

As in other fields where complexity was a major obstacle to analysis and execution, the specialists involved are looking at computers as a tool that will help them to succeed where up till now they have mostly failed.

The fact that computers can store and handle vast amouts of information has an important effect on the set of goals that planners can establish for themselves in a realistic manner today.

The main impact computer use will have is connected with the following:

1.- Models previously employed to describe the economic world were by necessity very aggregated, very few macroeconomic variables and equations could be handled; and with the added restriction of linearity for the sake of solving them by available means.

2.- Simulating different policies, exogenous changes in taxation, financing, credits, technologies, in order to find its implication on evaluation variables

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such as growth of national product, budgetary deficits, foreign currency balances, income distribution and employment, was practically out of the question. In other words "model experimentation" (the only morally admisible in most fields of social Sciences) was almost impossible.

With computers the limitations indicated are substantially relaxed. On the other hand, once these restrictions are eliminated, the accent of research must direct itself to better description of basic economic and social interactions, behaviours and relations; and also to better recopilation in quantity, veracity and timing of the basic data (economic and social statistics) to be manipulated by the behavioural equations of the model.

Socio-Economics Models will remain useless if both activities don't develop in parallel. Well established relations operating on poor data or, viceversa, masses of good data poorly handled for lack of knowledge of interactive relations will produce dissapointing results.

Resource Inventories

Resource inventories are an important part of the Data Base to be handled in the planning process, both for theoretical analysis and design and for effective implementation.

We can list the following classes of Resources that must be investigated as an essential basis for modern Planning:

1.- Natural Resources:

1.1 Land (farms, forests)

1.2 Water(rivers, lakes, fishering)

1.3 Minerals

1.4 Energy

2.- Human Resources, Population.

1.1 Total by sex and age.

1.2 Labour force (sex, age, health, education,etc.)

1.3 Total active Population by economic activity

3.- Physical Capital.

1.- Agricultural inphrastructure (dams, irrigation, other)

2.- Energy base (fuels, hidro-electricity)

3.- Transport System (roads, harbours, airports).

4.- Buildings (housing, factories, hospitals, etc.)

4.- Others

1.- Scientific and Technological System

2.- Institutional System

3.- Managerial resources.

We cannot attempt to describe all these items as to their relative importance, specific content (or codification for mechanized treatment), but I will refer to some of them to exemplify the type of problems that may arise. The main thing to bear in mind is that a great deal of thought is needed to determine what the content of these files should be in order to serve present and future objectives. Even more, how they can be created in such a way that they might serve yet undefined objectives at a reasonable cost. For instance in geological mapping is it worth investing in identifying mineral resources of not present worth but that might become valuable with changing economic conditions (low yield ores) or new technologies (as it has recently happened with uranium, zirconium, halfnium, etc.). Or in underground water mapping, should effort be invested in brackish waters that eventually, through reverse osmosis, electrodyalis or other desalination processes, might be of economic value?

Experts in Planning and area specialists should work as a team in each case to define the content, and updating periodicity, of the Data Base.

Data Collection is a costly and difficult operation that needs in most countries to be completely redesigned in order to make it more accurate, timely and specially automatic. It is necessary to plan it so that most data is obtained as side product of operations and not by special request or ocassional outside intervention. For instance, Personnel Registers could make periodic Census unnecessary.

Centralization of most Data Collection is also advisable to avoid repetitious activities and annoyance to suppliers of data, a common feeling in developping countries where statistics are unpopular for this as well as for other reasons (love of secrecy, tax dodging, and a feeling that little value is generated form this "nosy" activity).

Now, let us look more specifically to some of these resources.

Natural Resources

Though it has not been possible to discover a direct relationship between these resources and economic growth nobody can deny that at least potentially the welfare of a nation depends on the correct application of investment labour, technology, etc., to the use of natural resources.

The main difference between rich and poor countries lies not in the resources that they posess but rather in their degree of utilization and, specially when such utilization exists, in the part of the benefits that are retained within their national economies.

Despite their obvious importance, natural resources have not been given adequate attention in economic research. General studies of economic growth and capital formation give little or no place to them as a basic parameter as compared with the capital investments emplyed in developing them.

Data on these resources in the past was unsophisticated and of little use for economic development, it was mainly on physical magnitudes but it did not include the information required for studies of economic availability and marketing. For instance most of the studies and data on mineral resources deal almost exclusively with such matters as chemical contents of ores and geological characteristics.The problem of production costs, transport, availability and productivity of labour and energy, are not included. In short Data collection on resources is supply-oriented and of little use insofar as it is not complemented with other facts.(1)

A survey on National Resources Research in Low-Income countries (1) showed that 75% of studies dealt only with one aspect or another of the physical characteristics of them. Even so, total research on these matters was so scarce that there still existed an "extreme deficiency" of basic physical data. Modern techniques such as aerial supported surveys will need to be used for these deficiencies to be overcome.

Natural resources are geographically located. The merging and combined use of this data with other that is relevant to economic development, such as available local labour, housing, markets, roads, and harbours, etc. poses a problem of earthographic coding that is common to many of the other files - specially but not only the Population Data. Some countries such as Sweden are well advanced in the design of these coordinate systems that are necessary for computerized registers of population, real state and land use.

The Coordinate geographical coding of national resources is very relevant to modern Planning, as it is increasingly clear that development is not achieved so efectively on a product by product basis but as a result of a broad regional approach.

(1) "Nat.Resources inlow-Income Countries". I.Ahmad, University of Pittsburg Press 1960.

New technological concepts such as the Agro-Industrial Complex are outstanding proof of this new integrated view of the problems. Related investments in Industry, Agriculture, Mining and Infrastructure become more economic and socially beneficial within a Regional approach. Also regional planning permits a much more accurate evaluation of alternative decisions on such factors as degree of utilization of natural resources, of human resources (employment) and migration, productivity, return on Capital, etc. Computers are used in this context both to store and merge data and in applying optimization techniques as linear programing that take into account all the factors that have been mentioned above.

Human Resources

Governments have found useful for taxation and military reasons to have Population Registers since quite a long time. Before the Christian Era, they existed in China, Japan, Persia, Middle East. The Romans established the 5 year census in their empire.

Modern Population Data is obtained mainly by periodic census.However in the last few years, thanks to the Computers available, a continously updated Personal Data Bank has been or is being established in several countries (Israel, Denmark, Sweeden), etc. (1)

These registers give information on subjects such as:

1. Basic Demographic distribution and dinamics:

   1.1 Population growth

   1.2 Birth and Death statistics

   1.3 Age, Sex

   1.4 Marital Status and Changes.

   1.5 Rural and Urban Population and Dinamics

2. Economic Activity

   2.1 Types: industrial, agricultural, services, etc.

   2.2 Income distribution

3. Social Data

   3.1 Educational levels, skills

   3.2 Health statistics

   3.3 Military Training

   etc.

(1) "First International Symposium on Pop. Registers".I.C.A. Secretarial Jerusalem, 1967".

The type and amount of Data collected allows its use for many economic and social studies and decisions: Educational, Health, Housing forecasting and planning, Taxation control and Policy, Social Security projections, Defense, etc.

Many developping countries have become aware of what Walt Rostow once said: "High levels of economic aid are compatible with stagnation, an essential component of development is willingness and ability of nations to organize its own human and material resources". For this reason, there is much concern with population data on skills, specially in professions, science, technology and management, as lack of human resources in these areas is a major stumbling block to their progress. A separate, reduced personnal file on these scarce and highly valuable people is being created in many such countries with the cooperation of U.N. agencies.

With up to date data on human resources skills, some countries are able to plan their investment in Technical and University education from projections of their demand and supply of trained people. Education is in effect one of the areas where it is very easy to over/under/or/mis/invest with serious but not obvious consequences on the economic, social and very specially, on the political stability of the country.

In this field as in Natural Resources a lot of recent research is concerned with the relationship between development and investment. If F.Harbison conclusion that "about a third of the Growth of the National Product has come about from quantitative increases of capital and labour and that the rest is the result of better technology and management", is even partially correct this problem requires priority attention.

Finally, let us remember that human resources differ from other economic factors of production in being both an input to the system and the ultimate beneficiary or victim of its work. Modern population data must contain therefore data both on economic worth and social status. Present Data is not satisfactory as it is quite unbalanced in favor of social instead of economic statistics.

Physical Capital

People are well aware of the characteristics of these resources. Their codification, mechanization and availability in Computer Data Banks for multiple purppees should be fairly straightforward. Main problems are logistics and legal because these inventories are in many cases private property.

4. Others

The importance of "know-how" as a resource is an obvious one and has been the subject of increasing research. For the time being these resources are being partly registered as "human resources" of scientists, technicians, professionals, etc., but they also include the organizations associated with the Scientific and Technical System such as Universities, Research Institutions, Libraries and Documentation Services, etc.

Another very important resource that needs to be appraised consist of what each society has developped as Organizations. Each organized operating structure is much more than its parts, it is an instrument for thought or action. It is the difference between an inert accumulation of components and a dinamic combination of them. It is another resource. It must not be identified with "managerial resources" in spite of their obvious conection.

To know this resource may help a great deal to design and, very definitely, to implement plans, as they are bound to play an instrumental part in it. When these resources do not exist, in quantity and quality, they must be created. How to describe them in a useful manner is very important. Till now resource inventories of this type have been established as industrial, comercial, agricult or mining companies registers but with other objectives, mostly for control and taxation. Other data will have to be incorporated to these files to make them useful for government planning.

In Summary:

The advent of the Computer opens the way to overcome the frustrating difficulties of Planning for Development.

The power of the machine will not be substitute for any intelectual slackness in the analysis of what Data is needed for Planning, specially on resource characteristics relevant to development. A great deal of basic work is needed here so that these enormous masses of Data are not collected "per se" but to serve a worthy purpose.

With Computers, this Data Base can now be organized in such a manner that marge serve in a flexible manner Long (over 10 years), Medium (3-10) and Short Term Planning (1-3), and probably also Conjunctural Decision Making. At the same time can serve Regional, Sectorial and Global Planning. This organization of the Data Base is not only the most economic way of getting a return on the investment in Data collection, but also the only way to ascertain that the end results of the many processes to which it must be subject are compatible with each other. One of the nighmares of the past has been that so much Data was of poor quality, independently created and contradictory..